

10 ways to

Enhance
Learning
Experience in
Mathematics

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Learning Experiences in Mathematics

H2 math

- More Distinction at A level exam
- Higher passing rate
- Students working harder
- Well done to all JC math teachers!

Beyond H2 math

- Bridging the gap between A level and University math
- Metacognitive skills
- Good learning skills

Gap between A level & University math

- Learning approach
 - Rely on complete notes
 - Rely on a lot of examples
 - Rely on past year papers
 - Do not read math textbook
 - Not used to discussing math
 - Prefer teacher-centered learning

Gap between A level & University math

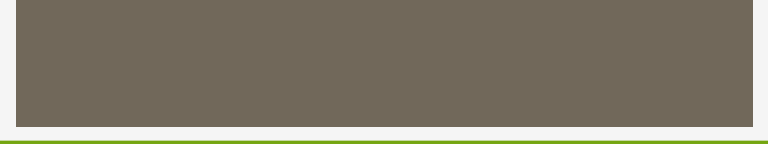
- Math skills
 - Understanding mathematical logic
 - Proper use of notation
 - Expressing mathematical idea
 - Solving unseen problems

Metacognitive skills

- See the big picture
 - Not just pattern recognition
- See the connection
 - Integrating the concepts
- See the relevance
 - Applying the concepts
- See beyond
 - Discovering math results on their own

Good learning skills

- Take notes
- Organize information
- Practice basic skills
- Use feedback from assessment
- Solve novel problems
- Discuss, articulate and explain ideas
- Self-read
- Set learning goal



Aspects
10 ~~ways~~ to
Enhance Learning Experience
in Mathematics

Give them the opportunity to take notes

- Basic learning skill
- Opportunity to express mathematical ideas
- Not to give complete notes
- Not too scanty
- Take notes VS copy notes
 - Fill in the blanks
 - Problems with incomplete solutions
 - Verbal instruction/remarks

Get them to organize information

- To reflect on and conceptualize their learning
- Prioritizing and connecting concepts
- Encourage students to summarize the topics / lectures
- Cheat sheets for exam?
- Guidance:
 - How to organize
 - What are the links
 - Alternative approaches

Improve their proficiency in mathematical language

- Essential for learning math!
- Vocabulary = terminology & notation
- Grammar = logic
- Pay more attention to logical statements
- Expose them to the language
- Give them opportunity to use the language
- Do not “translate” everything for them

Get them to explain

- To develop logical reasoning skill
- Set problems that require students to give explanation
- Explain in words
- Verbal or written explanation
- Make use of tutorial sessions for presentation

Train them to write properly

- Good training for rigor
- Surface any misconception
- Present their work clearly and precisely
- Write in complete sentences
- Use proper notation
- Give feedback/comment

Let them work on unseen problems

- Not to rely too much on pattern recognition
- Not to have the impression that solving math problems is algorithmic
- Don't try too hard to exhaust "all kinds" of novel problems
- Provide hints and scaffolding
- Encourage alternative approaches
- Reflect on, not just remember, the solutions

Facilitate discussion among themselves

- To enhance the learning
- Communication skill
- In class
 - tutorial sessions
 - lecture
- Outside class
 - Online forum
 - Group work

Create opportunity for them to collaborate

- To develop their collaborative skill
- Group work
 - Projects
 - Modeling
 - Complex problems

Encourage them to read math text

- To prepare them for self learning
- Give them reading assignment
- Specific reading
 - Recommend websites
 - Recommend articles / textbook
- Open ended
 - Pose a problem
 - Find out about a new concept
 - Find out about applications

Guide them to ask questions

- To cultivate inquisitive mind
- Prepare them for self discovery
- Encouragement
- Ask intellectual questions
- Ask them questions in class
- Answering by asking question
- Do not tell them “everything”
- To find out answers to their own questions

Make use of IT

- 1) GC
- 2) Website (Google)
- 3) YouTube
- 4) Applets
- 5) FB
- 6) Blog
- 7) CRS
- 8) Flip classroom
- 9) Screen capture software
- 10) Mobile Devices

Concluding remarks

- Are there time for these?
- Conflict of interest
- Striking balance
- Change in mindset
- Think beyond H2
- Convince the students
- Challenge the bright
- Let the weaker enjoy the learning experience